Shrink-induced single-cell plastic microwell array.

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Public Summary:

Scientific Abstract:
The ability to interrogate and track single cells over time in a high-throughput format would provide critical information for fundamental biological understanding of processes and for various applications, including drug screening and toxicology. We have developed an ultrarapid and simple method to create single-cell wells of controllable diameter and depth with commodity shrink-wrap film and tape. Using a programmable CO(2) laser, we cut hole arrays into the tape. The tape then serves as a shadow mask to selectively etch wells into commodity shrink-wrap film by O(2) plasma. When the shrink-wrap film retracts upon briefly heating, high-aspect plastic microwell arrays with diameters down to 20mum are readily achieved. We calibrated the loading procedure with fluorescent microbeads. Finally, we demonstrate the utility of the wells by loading fluorescently labeled single human embryonic stem cells into the wells.